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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/724,436      | 11/28/2000  | Eshel Ben-Jacob      | A33795              | 6759             |

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BAKER & BOTTS  
30 ROCKEFELLER PLAZA  
NEW YORK, NY 10112

EXAMINER

MARSCHER, ARDIN H

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1631

6

DATE MAILED: 07/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

09/724,436

Applicant(s)

BEN-JACOB ET AL.

Examiner

Ardin Marschel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 11 and 12 is/are rejected.
- 7) ☒ Claim(s) 6-10 and 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5. 6) ☐ Other:

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## **DETAILED ACTION**

### **DEFECTIVE OATH OR DECLARATION**

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:  
Non-initialed and/or non-dated alterations have been made to the oath or declaration. See 37 CFR 1.52(c).

A non-initialed alteration in the City for Shay Caspi is present in the Declaration, filed 5/29/01.

### **TITLE**

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The present title is directed to a method and apparatus wherein logical elements are characterized as being "single electron". In contrast the claims are directed to far more generic limitations with only certain claims, that is, claims 4, 5, 8, and 12, being directed to a "single electron" practice.

### **VAGUENESS AND INDEFINITENESS**

Claims 1-5, 11, and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The preamble of claim 1 directs the claimed circuit to being both digital as well as computational whereas confusingly there are no digital or computational network

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limitations in the elements cited in the claim. Thus, it is unclear whether the preamble or the actual elements cited in claim 1 control the metes and bounds of the claim.

Clarification via clearer claim wording is requested. This unclarity is also present in claims 2-5 and 11 which are dependent directly or indirectly from claim 1 due to their dependencies.

In claim 12, line 16, the phrase "the active cores" lacks clear antecedent basis as to what is meant thereby in the DNA set forth previously in the claim. Clarification via clearer claim wording is requested.

### **PRIOR ART**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3 are rejected under 35 U.S.C. 102(e)(2) as being clearly anticipated by Wang et al. (P/N 6,468,785).

Wang et al. discloses a DNA detection apparatus in the abstract wherein electrochemical detection is described. In column 7, line 10, through column 9, line 6, the conductivity of polymer coated electrodes is utilized for detection of DNA hybridization. The electrical conductivity of the DNA network on said electrodes is

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disclosed in column 7, line 54, through column 8, line 29, to result in current peaks when DNA hybridization occurs. This network of conductive DNA included materials thus discloses DNA-based conductive elements as required in instant claim 1. The repetitive limitation of instant claim 1 is anticipated by the repetitive measurements disclosure in column 11, lines 53-62. Instant claims 2 and 3 are included as rejected hereinunder because charge movement is deemed to inherently always require some type of hopping/tunneling practice to move along a polymer chain of heterologous atoms. Applicants are also reminded of the above rejection under 112, second paragraph, in that one possible interpretation of the instant claims is to deem the actual network elements as defining the metes and bounds of the claims without a requirement for digital computational practice as in the preamble of instant claim 1.

Claims 1-4 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Braun et al. (WO 99/04440).

Braun et al. discloses the preparation of a single electron transistor (SET) from oligonucleotides on page 30, line 9, through page 31, line 15. Such oligonucleotides are nucleotide chains made up from DNA as described on page 16, lines 4-10, or DNA monomers as described on page 5, lines 5-9. The SET is conductive as required in instant claims 1 and 4 as well as repetitive in that repetitive arms are shown in Figure 6 as described in the page 30-31 disclosure of this device. Thus, this disclosure anticipates the above listed instant claims. Instant claims 2 and 3 are included as rejected hereinunder because charge movement is deemed to inherently always require

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some type of hopping/tunneling practice to move along a polymer chain of heterologous atoms.

### INFORMALITIES

The disclosure is objected to because of the following informalities:

Claim 12, contains improper periods within the claim. Periods are only permitted properly at the end of a claim and at abbreviations. It is noted that improper periods are present in claim 12 in lines 12, 13, 16, 19, and 26.

Appropriate correction is required.

Claims 6-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

No claim is allowed.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 CFR § 1.6(d)). The CM1 Fax Center number is either (703)308-4242 or (703)305-3014.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ardin Marschel, Ph.D., whose telephone number is (703)308-3894. The examiner can normally be reached on Monday-Friday from 8 A.M. to 4 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, Ph.D., can be reached on (703)308-4028.

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Any inquiry of a general nature or relating to the status of this application should be directed to Legal Instrument Examiner, Tina Plunkett, whose telephone number is (703)305-3524 or to the Technical Center receptionist whose telephone number is (703) 308-0196.

July 25, 2003

*Ardin H. Marschel*  
ARDIN H. MARSCHEL  
PRIMARY EXAMINER